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Reading Comprehension Strategies for Adult Literacy Outcomes

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ABSTRACT

Although research on improving child literacy is converging, no such body of research exists for adult literacy. Yet the need is no less significant. This study extends the knowledge garnered with younger populations by determining the reading comprehension strategies most important to adults' success on adult literacy outcome measures and aligning them with previously researched interventions. According to an analysis of key adult literacy outcome measures (i.e., competency-based, standardized tests of literacy commonly accepted as reasonable proxies for the global construct of adult literacy: Comprehensive Adult Student Assessment System [CASAS], General Educational Development [GED], and National Assessment of Educational Progress [NAEP]), adults should benefit from strategies that teach looking for clues in or generating questions about a text. Additionally, adults need to learn how to summarize and draw inferences in order to address higher-level literacy demands. Adult learners also need a metacognitive strategy to self-regulate reading behavior (e.g., choose a strategy to use, evaluate its effectiveness, and abandon and choose another strategy if necessary.) Furthermore, when using a competency-based standardized test, adult learners need to be coincidentally taught test-taking skills to reduce the test-related task demands and produce a better index of a learner's reading comprehension skills.

Reading Comprehension Strategies for Adult Literacy Outcomes

Even before the *No Child Left Behind* legislation (P.L. 107-110) required public schools to use effective methods and instructional strategies that are based on scientific research, the converging research indicated ways to improve child and youth literacy (National Reading Panel, 2000). No such body of scientific research has yet to emerge for adult literacy interventions, while the need for it is no less significant.

The National Adult Literacy Survey (Kirsch, Jungeblut, Jenkins & Kolstad, 1993) reported nearly half of all adults in the U.S., or 90 million people, scored in the two lowest levels of functional literacy; 58% of those individuals are between 16 and 55 years old — today's workforce (Moore & Stavrianos, 1995). The economic, civic, and cultural implications of this collective literacy deficit merit the attention and resources of the scientific research community.

One possible way to quickly address the lack of scientific research-based interventions for adult literacy is to extend the knowledge garnered with younger populations to meet adult needs. Several studies have reported that instructional techniques traditionally used with children with learning disabilities are adaptable and effective in teaching adults with learning disabilities (Bell & Lindamood, 1992; Greenberg, Ehri & Perin, 1997; Idol-Maestas, 1981; Lewkowicz, 1987). However, the effectiveness of most reading intervention research with children has been evaluated using measures of reading component skills such as word recognition (accuracy and or fluency) and reading comprehension (Foorman, et al., 1997; Torgesen, Wagner, & Rashotte, 1997; and Velluntino, Scanlon & Tanzman, 1994), and reflected by grades in school or standardized achievement test results. In contrast, many outcome measures of adult literacy shift to ecologically valid, functional outcomes (Merrifield, 1998; Wagner & Venezky, 1999) related to employment, citizenship, and family membership.

Because an adult's literacy is measured on different dimensions from a child's or youth's, several competency-based, standardized tests of literacy are commonly accepted as reasonable proxies for the global construct of adult literacy. Tests such as The Adult Basic Learning Examination (ABLE), Comprehensive Adult Student Assessment System (CASAS), Test of Adult Basic Education (TABE), National Assessment of Adult Literacy (NAALS), and the General Educational Development (GED) may be useful in evaluating the effectiveness of a reading comprehension intervention with adult learners.

Reading comprehension is the ultimate goal of any reading activity, especially functional literacy tasks. Reading comprehension is a collective term that describes the result of grasping the meaning from a text with one's intellect — a task that involves many skills. To achieve reading comprehension the reader employs skills such as identifying the main idea of a passage, summarizing the content of a text, generating questions about the information in the text and looking for clues that answer those questions (Curtis, 2002; Gersten, Fuchs, Williams, & Baker, et al., 2001; Kamil**,** 2003**;** National Reading Panel, 2000; RAND Reading Study Group, 2002). Readers also draw inferences from the text and perhaps even create visual images of the ideas or processes presented in it in order to achieve comprehension. Gersten, et al. (2001) noted different reading comprehension skills are required when reading expository and narrative text (e.g., deleting redundant information, deleting trivial information, locating topic sentences, detecting valid arguments in text).

With the large number of skills that contribute to reading comprehension, determining which are most important for adult literacy is difficult. The purpose of this research was to identify (a) the reading comprehension skills that are most important to adults' success on three

commonly accepted literacy measures, and (b) intervention strategies, which were previously researched and found effective with adolescents, that may be most helpful for instructors to use with adults with literacy deficiencies.

Method

Research Design

A multi-disciplinary team of researchers — with expertise in adult education; special education with emphasis on learning disabilities; speech, language, and hearing; and psychology and research in education — designed the assessment protocol to examine the relationship between reading comprehension strategies and adult literacy outcome measures based on Weber's (1985) content analysis recommendations. Researchers established a categorical framework for the content analysis using three dimensions: text structure, reading comprehension strategy, and specific intervention strategy. The recording unit was defined as an individual test item so that results could be analyzed for patterns within each test.

Three categories of text structure were established for the analysis: expository, narrative and documents. Documents, a special type of expository text such as want ads or job applications, were treated as a separate category because of their importance in functional literacy assessments.

Six key reading comprehension strategy categories were selected based on a review of published literature on the subject (Curtis, 2002; Dole, Duffy, Roehler, & Pearson, 1991; Gersten et al., 2001; Kamil, 2003; National Reading Panel, 2000; RAND Reading Study Group, 2002). These strategy categories were operationally defined for this study as: (a) Identifying the Main Idea, (b) Summarizing, (c) Drawing Inferences, (d) Generating Questions, (e) Creating Visual Images, and (f) Looking for Clues. A metacognitive strategy for monitoring comprehension was considered a part of all these reading comprehension strategies, and thus was not treated as a separate category. Figure 1 provides a brief description of reader behavior in each strategy.

Intervention strategies. To determine which intervention strategies would most likely help an adult learner become proficient in using the needed reading comprehension strategies, the research team employed a set of scientifically researched intervention strategies known as the Strategic Instruction Model, or SIM Strategies, as representatives of the larger body of research on reading comprehension interventions. The interventions were: (a) *Paraphrasing* (Schumaker, Denton, & Deshler, 1984); (b) *Story Grammar* (Hock, In Prep.); (c) *Self-Questioning* (Schumaker, Deshler, Nolan & Alley, 1994); (d) *Visual Imagery* (Schumaker, Deshler, Zemitzsch & Warner, 1993); (e) *Visual Interpretation* (Lenz, In Prep.); and (f) *MultiPass* (Schumaker, et al., 1981). Figure 2 provides a brief description of each SIM intervention strategy.

Materials

Researchers selected four literacy outcome measures for use in this study. The ABLE, Form E, Level 3, was selected for practice scoring and delineating the strategy categories. Three tests with differing levels of difficulty and purpose were chosen for the content analysis: CASAS Employability Competency System (2002) reading test Levels A through D (two versions of each), the GED half-length predictor test for language arts and reading (McGraw-Hill/Contemporary, 2002), and a portion of the public release of the eighth-grade level National Assessment of Educational Progress (NAEP; U.S. Department of Education, 1990).

Figure 1
Reading Comprehension Strategies

Identifying the Main Idea
- Determine what the author thinks is more important in a paragraph.
- Select some information.
- Delete some information.
- Condense some information.
- Integrate some information into a paraphrase.

Summarizing
- Determine what is most important in a unit or selection.
- Select some information.
- Delete some information.
- Condense some information.
- Integrate some information into a summary.

Drawing Inferences
- Draw inferences based on the reader's prior knowledge.
- Fill in details missing from the text.
- Draw inferences from prior text knowledge.
- Elaborate on what was read.

Generating Questions
- Generate questions about setting, character plot, and theme in narratives
- Generate questions about expository texts based upon author generated structures such as:
  -compare and contrast
  -descriptive (traits, functions, properties)
  -sequence
  -explanation of concepts or terms
  -definition-examples
  -problem-solution-effect
  -cause and effect.

Creating Visual Images
- Read small sections of the text.
- Create visual images or pictures about the text.
- Evaluate and refine the images and pictures.

Looking for Clues
- Find descriptive word clues.
- Search for clues to the elements of fiction.
- Look for in the pictures, headings, graphics, and author's questions

Figure 2
Specific Interventions

*Paraphrasing (*for *Main Ideas)*
- Read by "chunking" each paragraph:
  - -Locate the Main Idea (MI) of a paragraph,
  - -Locate the Key Details (D).
- Paraphrase the MI and D.

*Story Grammar (*for *Summarizing* narratives*)*
- Find elements of fiction in text.
- Make predictions from elements of fiction.
- Summarize the predictions orally.
- Draw conclusions about the predictions.

*Self-Questioning (*for *Generating Questions)*
- Look for word, picture clues in text.
- Ask yourself the "W" questions about clues.
- Make prediction based on the questions.
- Read to find answers to your predictions.
- Evaluate the accuracy of the predictions.
- Summarize your predictions orally.

*Visual Imagery (*for *Creating Visual Imagery)*
- Find descriptive word clues in narrative text.
- Create a visual image from clues to include:
  - –A general scene or picture,
  - –Specific visual details found in the scene.

*Visual Interpretation (*for *Looking for Clues:* pictures & graphs*)*
- Scan graphics in reading selection.
- Make predictions about graphic meaning.
- Analyze clues within the graphics.
- Find the main idea of each graphic.
- Paraphrase main ideas.
- Summarize ideas.

*MultiPass (*for *Looking for Clues* in text*)*
- Survey chapter for text and question clues.
- Read chapter/section questions.
- Skim to find answer paragraphs.
- Paraphrase answer paragraphs (RAP).
- Answer questions in writing.

The CASAS reading test is administered as a pre- and post-test in many adult education programs to assess functional skills and learner gains. In many states CASAS is used by social service agencies to determine educational services provided to clients (e.g., basic skills, job readiness training, on-the-job training, mentoring). The CASAS is a leveled test, and thus was expected to demonstrate the differences between reading skills needed for success at each level of literacy.

The GED language arts and reading assessment, on the other hand, is an achievement test that reflects the societal standard of literacy commensurate with high school attainment. Successfully passing the GED's five tests provides certification of literacy for the large number of youths who leave school prior to graduation.

Although the CASAS and GED are well known in the adult education community in the United States, the NAEP is recognized as a standard of literacy in the broader literacy community. Different levels of the NAEP are used in public schools throughout the United States, and its psychometric properties are better known than those of the CASAS and GED. Thus, the NAEP was included in this study as a point of comparison.

Participants

A panel of six analysts — two practitioners and four researchers — was assembled to conduct the content analysis of the selected outcome measures. Each panelist had extensive knowledge of reading instruction, standardized measures, cognitive and metacognitive reading strategies, and strategies for instruction, as well as experience in teaching reading strategies. The panel conferred 5 times as part of their preparatory training to perform the content analysis.

Procedures

Practice Scoring. The panel of analysts practiced categorizing items from the ABLE to ensure discreteness of categories, clarification of decision rules, and any hierarchical relationships among categories. Researchers provided the panelists with an *Analysis of Content Measures Notebook* to ensure procedural fidelity and descriptions of each reading comprehension strategy. For the training activity, the panelists each assumed the role of an adult learner taking the ABLE test, and they determined the reading comprehension strategies he or she would use to read each passage and correctly answer the comprehension questions that followed. The panelists independently scored the test items by classifying the text structure of the associated reading passage and noting a first- and second- choice reading comprehension strategy on a score sheet. After completely scoring all the test items, panelists aligned their first- and second-choice reading comprehension strategies with specific intervention strategies.

Decision rules. Discoveries made in the practice-scoring process with the ABLE led researchers to impose new decision rules. First, the practice scoring showed that good readers could use different reading comprehension strategies to obtain the same outcome on a test item, sometimes due to the similarity between strategies. For example, Identifying the Main Idea is very much like Summarizing, the difference having to do with the length of the passage and number of paragraphs analyzed at one time. Thus, researchers gave the panelists a decision rule: If the passage length is more than two paragraphs, choose Summarizing; if one or two paragraphs, choose Identify the Main Idea.

Panelists were often split between the first- and second-choice strategies, which suggested that they disagreed. For example, for a given test item, three panelists made their first-choice strategy Looking for Clues, and second choice Generating Questions, while the other

three panelists chose the same two strategies, but in reverse order. Therefore, the researchers decided that when tallying scorer agreement, an agreement of five-out-of-six panelists on their first- or second-choice strategy selection counted as scorer agreement.

Scoring. Next the panel of analysts independently analyzed test items from CASAS, GED, and NAEP according to the procedures, definitions, and decision rules developed during practice scoring. Each panelist scored the three outcome measures in random order to eliminate order bias.

Scorer agreement and frequency analysis. The first author tallied the panel's scoring results for each outcome measure, calculating the percentage of test items on which scorer agreement was obtained, and noting which first- and second-choice strategies panelists selected. A second researcher randomly selected 25% of the scoring results to retally: one CASAS Level A, one CASAS Level D, and the GED. An interrater reliability of 93%, or 69 out of 74 test items, was achieved.

In addition to the scorer agreement analysis, researchers performed a frequency analysis of test items to identify patterns of reading comprehension strategies required for success on each outcome measure.

Aligning intervention strategies. As the final step in the analysis, the panelists aligned the top four reading comprehension strategies to the SIM intervention strategies they judged to be most likely to help an adult learner become proficient in using the needed reading comprehension strategies.

Results

Scorer Agreement

Reading comprehension is a complex process of developing an understanding of textual materials. Given this complexity, the first concern was whether panelists could reliably agree on their ratings of items.

Panelists agreed on the first- and second-choice strategy in a range between 67% and 100%, depending on the text structure and level of difficulty. Scorer agreements were highest for reading selections and tasks related to document text structures, which are most predominant in CASAS Levels A through C. For example, scoring agreement for an employment ad in which the reader had to find the starting wage was 100%. On the other hand, the panelists had less agreement (71% to 90)for test items on the GED and NAEP (e.g., short stories, plays, and poems) because the panelists judged that different strategies may be used with equal effectiveness with narratives. The complete listing of interrater scoring agreements is included in Table 1.

Frequency Analysis

The frequency analysis (see Table 2) showed panelists nearly always chose Looking for Clues and Generating Questions as the top two strategies for CASAS Level A. As CASAS difficulty increased to Level D, the most frequently selected strategies were still Looking for Clues and Generating Questions, however, Summarizing and Drawing Inferences were chosen for 10% to 15% of the items. Strategy choices widened as the literacy tasks became more demanding in the GED and NAEP. Panelists most frequently chose Summarizing and Drawing Inferences for the GED; they chose Looking for Clues, Summarizing, Generating Questions, and Drawing Inferences for the NAEP.

The frequency analysis by outcome measure showed that very often the panelists noted that an item required the reader to use more than one strategy. For example, 85% (17 out of 20) GED items required the reader to draw an inference from a reading passage, and 70% (14 of the same 20 items) also required the reader to summarize.

CASAS Level A test items were judged to require the reader to look for clues 100% of the time. The reader needed to generate a question about 84% of the items, and draw an inference only 10%. A similar, but less extreme, pattern was found for CASAS Levels B and C. CASAS Level D items similarly placed a high priority on Looking for Clues (67%) and Generating Questions (64%), but required a wider variety of other strategies as well—Identifying the Main Idea (12%), Drawing an Inference (10%), and Summarizing (3%).

Table 1
Inter-rater Scoring Agreements

Outcome Measure	Percent of Items with Scorer Agreement	
	1st Choice	2nd Choice
CASAS Level A, 611	100%	75%
CASAS Level A, 612	96%	96%
CASAS Level B, 613	77%	67%
CASAS Level B, 614	80%	73%
CASAS Level C, 615	87%	77%
CASAS Level C, 616	79%	82%
CASAS Level D, 617	83%	77%
CASAS Level D, 618	80%	67%
GED	75%	90%
NAEP	71%	71%

Table 2
Frequency Analysis

Outcome Measure	Top Choice Reading Comprehension Strategies	
	1st Choice	2nd Choice
CASAS Level A	Looking for Clues	Generating Questions
CASAS Level B	Looking for Clues	Generating Questions
CASAS Level C	Looking for Clues	Generating Questions
CASAS Level D	Looking for Clues (40) Summarizing (9)	Generating Questions (32) Drawing Inferences (6)
GED	Summarizing	Drawing Inferences
NAEP	Looking for Clues (8) Summarizing (6)	Drawing Inferences (13) Generating Questions (4)

Intervention Strategies

The panelists aligned the top four strategies to the SIM intervention strategies to determine those strategies most likely to help an adult learner become proficient in using the needed reading comprehension strategies. Self-Questioning (Schumaker et al., 1994), Visual Imagery (Schumaker et al., 1993), and MultiPass (Schumaker et al., 1981) intervention strategies were selected as most helpful for teaching an adult learner to look for clues in a text; Self-Questioning for instructing a learner to generate questions; and Paraphrasing (Schumaker et al., 1984) for learning to summarize. Although these intervention strategies fit very well with three of the four top reading comprehension strategies, no intervention strategy fully addressed how to instruct a learner to draw inferences.

The research team found that Summarizing and Drawing Inferences are the most important reading comprehension strategies for adult literacy outcomes. The SIM *Paraphrasing* and *Self-Questioning* interventions (revised to include drawing inferences) are most likely to benefit adult learners. The functional nature of the CASAS Levels A through D predominantly required the very basic strategies of Looking for Clues and Generating Questions; in contrast, the GED's language arts and reading exam required the more advanced strategies of Summarizing and Drawing Inferences.

The differences between the recommended reading comprehension skills for the GED and CASAS are a good reminder that the tests serve different purposes. The CASAS is heavily focused on lower level comprehension questions. For example, CASAS Level D asks 40 questions judged to benefit from Looking for Clues (low-level comprehension) and only nine Summarizing (high-level comprehension) questions. The GED is just the opposite; it asks many high-level comprehension questions, and no low-level comprehension questions. Thus, the CASAS may not be as good a measure of high-level comprehension, but may be useful for functional reading assessment.

The different skills assessed by the outcome measures, adult learner goals (e.g., simple reading versus certification as a high school graduate), and skills with which they enter adult education necessitate a range of intervention strategies be available to adult learners. Furthermore, the content analysis makes clear that functional literacy is complex, placing multiple requirements on adult readers. Proficient readers do not rely on just one reading comprehension strategy, but several. Thus, adult education program staffs need interventions that equip learners with a "full toolbox" of reading comprehension strategies. In some cases these strategies may work independently, and in others, interdependently. For example, the *Paraphrasing* strategy actually links multiple subordinate strategies by teaching a reader to read a paragraph, which is a chunking strategy**;** ask yourself to identify the main idea and a couple important details, using a self-questioning strategy; and put the main idea and details into your own words, which is a paraphrasing strategy. Thus, *Paraphrasing* is a multiple strategy made up of three discrete but mutually supportive strategies.

An implication of providing adult learners a full toolbox of reading strategies is they must know not just how, but when, to use a particular strategy. A proficient reader must be able to self-regulate reading behavior: choose a strategy to use, evaluate its effectiveness, and abandon and choose another strategy if necessary. We are uncertain about how and when instructors need to explicitly teach these metacognitive processes, or whether learners develop these

metacognitive processes on their own as they become more proficient with reading comprehension strategies.

With a full toolbox of strategies and a metacognitive process for using them, one might expect success on the outcome measures of adult literacy. However, the panelists observed their own metacognitive processes when analyzing the outcome measures could not be confined to reading comprehension strategies. They found themselves using test-taking strategies (e.g., eliminating obviously wrong answers on multiple choice questions, or underlining key words and phrases.) Thus, we believed in order to evaluate the efficacy of an adult literacy intervention, even when using a competency-based standardized test, adult learners need to be coincidentally taught test-taking skills. If one applies the Bruner, Goodnow, and Austin (1962) principle about cognitive strain, teaching test-taking skills makes ready sense.

The basic concept of cognitive strain is that learners have a limited capacity for focusing attention and integrating information. The more task demands that a learner confronts, the more difficult the task is judged. Increasing learners' proficiency increases their efficiency and reduces their cognitive strain. Thus in a reading comprehension task, we could get a better index of a learner's reading comprehension skills if the test-related factors were less taxing on the learner's capacity.

One might see this approach to selecting literacy intervention strategies and instructing adult learners as teaching to the test. However, unlike elementary- and secondary-level classroom or standardized tests, the skills assessed by adult literacy outcome measures are definitive of functional literacy, placing authentic performance demands on the test-taker. In the same way that a technical school might teach a future mechanic to use tools to repair cars and assess his or her qualifications through performance of authentic car repair tasks, so too adult literacy education teaches adult learners to use tools to read with comprehension and assesses their qualifications by authentic reading tasks on the CASAS or GED. Therefore, the process of selecting interventions that teach adult learners to use the literacy tools that lead to success on these outcome measures accomplishes the goal of increasing literacy in employment, citizenship, and family membership, not just achieving a particular score on a test.

This study identified the intervention strategies most likely to benefit adult learners with literacy deficiencies, but has not, in fact, showed them to be effective in producing functional literacy. Further research into the actual efficacy of these intervention strategies with adult learners is the goal of a subsequent study. In addition, the development and validation of an intervention strategy that aids adult learners in drawing inferences is an important next step in adult literacy research.

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